

## ABSTRACT

An active noise cancellation system includes a series of features for more effective cancellation, greater reliability, and improved stability. A particular feature adapted for headset systems includes locating a residual microphone radially offset from the center of a sound generator to detect a signal more similar to that incident upon the eardrum of the user. In addition, an open back headset design includes perforations on the side of the headset instead of the back, so that the perforations are less susceptible to inadvertent blockage. The system also includes a mechanism for detecting changes in the acoustic characteristics of the environment that may be caused, for example, by pressure exerted upon the earpieces, and that may destabilize the cancellation system. The system automatically responds to such changes, for example, by reducing the gain or the frequency response of the system to preserve stability. The system further includes other methods for detecting imminent instability and compensating, such as detecting the onset of signals within enhancement frequencies characteristic of the onset of instability, and adjusting the gain or frequency response of the system or suppressing the enhanced signals. The system further includes a mechanism for conserving battery life by turning the system off when sound levels are low, or adjusting the power supply to the system to correspond to the current power requirements of the system.